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YELLOWSTONE RIVER COMPACT COMMISSION

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YELLOWSTONE RIVER

COMPACT COMMISSION

THIRTY-SIXTH ANNUAL REPORT

1987

YELLOWSTONE RIVER COMPACT COMMISSION

821 East Interstate Avenue
Bismarck, North Dakota

Honorable Mike Sullivan
Governor of the State of Wyoming
Cheyenne, Wyoming

Honorable Ted Schwinden
Governor of the State of Montana
Helena, Montana

Honorable George Sinner
Governor of the State of North Dakota
Bismarck, North Dakota

Dear Sirs:

Pursuant to Article III of the Yellowstone River Compact (YRC), the Commission submits the following thirty-sixth annual report of hydrologic conditions in the Yellowstone River basin for the period ending September 30, 1987 and Commission activities since the last annual report.

The Yellowstone River Compact Commission held its annual meeting in Cody, Wyoming on November 9, 1987. Mr. Gordon W. (Jeff) Fassett, Wyoming State Engineer; and Mr. Gary Fritz, Administrator, Water Resources Division, Montana Department of Natural Resources and Conservation; the designated representatives of their respective States; and Mr. L. Grady Moore, the designated Federal representative and chairman, were present.

Others present included:

Ron Billstein, HKM Associates, Billings, Mont.;
Craig Cooper, Wyoming State Board of Control, Riverton, Wyo.;
Chuck Dalby, Montana Department of Natural Resources and Conservation, Helena, Mont.;
William H. Gay, Gay Ranch Inc., Broadus, Mont.;
Jennifer Hager, Wyoming Attorney General's Office, Cheyenne, Wyo.;
Bill Hergett, Landowner, Cheyenne, Wyo.;
Chelsey Lee, Powder River Basin Resource Council, Sheridan, Wyo.;
Joe Moreland, U.S. Geological Survey, Helena, Mont.;
Richard Moy, Montana Department of Natural Resources and Conservation, Helena, Mont.;
Dan Saunders, Little Horn Energy, Inc., Sheridan, Wyo.;

John Shields, Wyoming State Engineer's Office, Cheyenne, Wyo.;
Michael Whitaker, Wyoming State Board of Control, Sheridan, Wyo.;
Jason White, Montana Department of Natural Resources and Conservation, Helena, Mont.; and
Jim Wilson, U.S. Geological Survey, Cheyenne, Wyo.

The meeting was called to order at 1:00 p.m. on November 9, 1987 by Grady Moore. He apologized for not getting the stationery letterhead changed to reflect the change of the Wyoming State Engineer and the location of his headquarters. The first order of business discussed was:

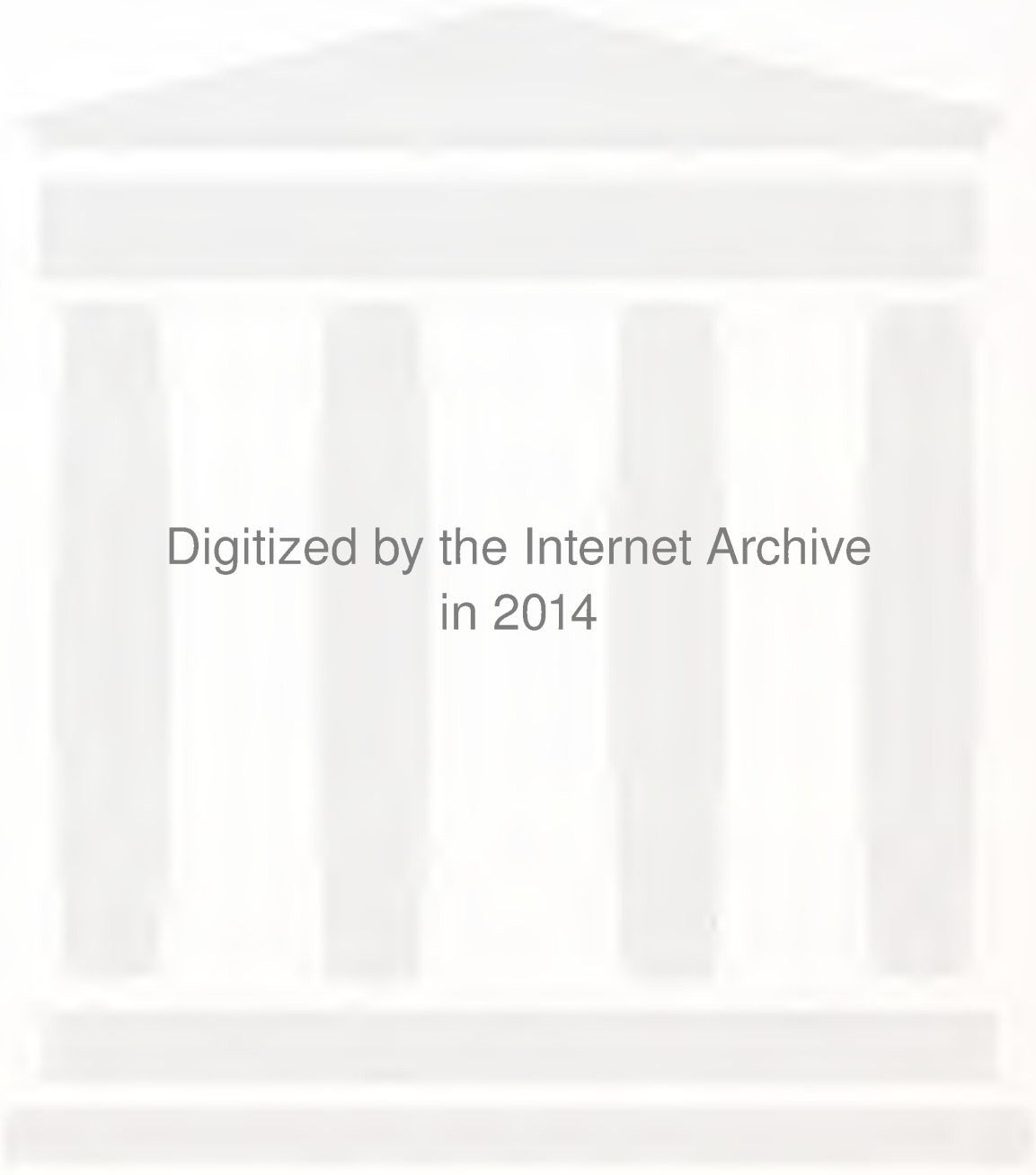
1. ADJUDICATION OF INTERSTATE DITCHES - DOCTOR DITCH, INTERSTATE DITCH, AND SIRRINE DITCH:

The report and recommendations of Craig Cooper, Superintendent Water Division No. 3, were forwarded to Mr. Moore on October 9. In compliance with the rules and regulations established by the Yellowstone River Compact Commission (YRCC) in 1984, the report and recommendations take into account all activities that occurred since the Commission authorized the adjudication of the interstate ditches.

Craig Cooper provided a summary of the report. The three ditches divert water in Wyoming which is conveyed across the State line to irrigate lands in Montana. Historically, the lands under these three ditches have not been granted water rights by either State because of the jurisdictional question of attaching rights to lands in another State. In 1984, the YRCC promulgated rules which allowed users of pre-Compact priority interstate ditches to file claims with the YRCC, which would adjudicate a water right based on the basis of the claim form, the record submitted, and evidence taken at the required public hearing.

Three ditches were acted upon at the meeting: (1) Doctor Ditch, which diverts water from the Clarks Fork Yellowstone River in Wyoming across the State line and irrigates land in Montana. It also irrigates land in Wyoming, but that land has water rights under Wyoming water law. (2) Interstate Mining and Irrigation Company Ditch, which diverts water out of the Clarks Fork Yellowstone River in Wyoming and is used to irrigate land in Montana. The ditch does not have any Wyoming water rights. (3) Sirrine Ditch, which diverts water from the Clarks Fork Yellowstone River in Wyoming and irrigates a large number of acres in Wyoming. The ditch also crosses the State line and irrigates a small number of acres in Montana.

Claims were submitted detailing the historic use of water from the three ditches mentioned above and several others. The field verification team, consisting of Wyoming and Montana water-resources personnel, addressed the three major ditches first. The claims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were submitted, field verified by personnel from Montana and Wyoming, and modified as necessary after field inspection with respect to acreage, location, and so forth. A public hearing was then held on May 14, 1987 to hear claimants' testimony regarding their claims, how much water they were receiving, justification for their water right priority date, and so forth. That transcript with maps of the irrigated lands, exhibits of ownership, and the claims were transmitted to the YRCC with a copy to each of the States. The States provided review to the YRCC as it considered adjudication of water rights for these ditches. Wyoming water right certificates for the landowners could be issued after the YRCC determined the amount of the right, the location, the priority date, and so forth.

The water right appropriations for these ditches will be made under Wyoming law, which allows appropriations of 1 cubic foot per second for each 70 acres of land to be irrigated. Water rights prior to 1945 receive a surplus right of an additional 1 cubic foot per second per 70 acres to be irrigated. The standard certificate of appropriation issued by the Wyoming State Board of Control includes a specific reference to the surplus water law which automatically provides the additional 1 cubic foot per second per 70 acres with the issuance of the certificate. The water rights will be published in the Board of Control water right tabulation books and hence due notice given to all appropriaters that these are proper and recognized Wyoming rights.

Mr. Moore mentioned an error in the report. On page 5, item 12, the adjudication for Lewis J. Singari should be 105.5 acres rather than 95.5 acres.

Mr. Moore advised he would entertain a motion that the YRCC approve the findings made by the Superintendent and forward them to the Wyoming State Board of Control for issuance of certificates. Mr. Fassett moved the motion and Mr. Fritz seconded. The motion was approved unanimously. Mr. Moore will mail the adjudications to the Board.

Mr. Dalby reported that the Britton Ditch, which was in the original group of claims received by the YRCC, is not ready for adjudication because extensive field review will be required to unravel the intricacies in diversion. Montana also has uncovered some claims during their adjudication of the Yellowstone tributary basins. Because these and other claims will probably arise from time to time, Mr. Dalby suggested the YRCC preserve the process used to adjudicate the claims thus far to adjudicate future claims as they arise.

Mr. Fassett commented that the YRCC rules have closed the door on the original claimants because the deadline specified in Article VI of the rules for submitting claims has passed.

Mr. Moore suggested that the issue of future claims be addressed at the next meeting.

2. STREAMFLOW AND RESERVOIR CONTENT OVER THE LAST WATER YEAR:

Mr. Moreland reported that the streamflow at the four Compact gaging stations--the Clarks Fork Yellowstone River, the Bighorn, the Tongue River, and the Powder River--was significantly below normal. The Clarks Fork Yellowstone River had an annual flow of 571,200 acre-feet which was 76 percent of normal for the period of record. The Bighorn River had a flow of 2,151,700 acre-feet which was 82 percent of normal for the period of record. The Tongue River had a flow of 177,200 acre-feet which was 57 percent of normal for the period of record. The Powder River had a flow of 404,000 acre-feet which was 92 percent of normal for the period of record. Very little snowpack resulted in very low spring runoff. Most of the rest of the year was near normal. There was some rain during the summer which kept the late summer and fall flows fairly close to normal in most of the streams.

A handout on the monthly distribution of flow at the four measuring sites was briefly discussed. Future reports will include a 25-year average.

The budget for 1987 which funded the operation of the five gaging stations (two are needed in the Bighorn system to obtain the required records) totaled $33,200. The budget for 1988 is estimated at $34,400, which would include $8,600 each from Montana and Wyoming plus $17,200 matching funds from the U.S. Geological Survey. The 1989 budget includes a 5 percent increase over 1988 and totals $36,100 or $9,025 from each State and $18,050 from the U.S. Geological Survey. Since the States prepare their budgets on a biennium, the U.S. Geological Survey will only charge $33,200 for the 1988 operations, which is the amount estimated last year. Mr. Moreland will provide more accurate estimates of operating costs, including 1990 costs, when he prepares the cooperative agreements.

3. WYOMING WATER DEVELOPMENT COMMISSION ACTIVITIES:

Mr. Fassett reported on two projects in the Yellowstone drainage in Wyoming. One is the enlargement of the Buffalo Bill Reservoir in Cody which received a sizeable contribution of State funds. The other is the Shoshone Conduit Project which is a municipal treated-water pipeline that will extend from Cody down the full length of the Shoshone River valley. The Shoshone Conduit Project will serve the municipalities along the Shoshone River with treated water derived from a combination of those municipalities' water rights and storage from the Buffalo Bill Reservoir. The conduit project has been given full legislative approval and has been funded.

Other projects include the enlargement of Adelaide Reservoir (Shell Creek) which is an existing facility above the Bighorn River. A planning report is also being prepared to solve the Sheridan regional water supply situation. The proposed Deer Creek Dam in

the North Platte River drainage is being driven by the need for water in the Casper metropolitan area. The Middle Fork Dam project has slipped in priority with the Water Development Commission because of uncertainties over control of the project, as between the Powder River Reservoir Company and the State of Wyoming, due to the complicating factor of the Reservoir Company holding the reservoir permit.

4. POWDER RIVER WATER-QUALITY TREND ANALYSIS:

Mr. Moreland reported on the Powder River water-quality trend analysis. In 1983 the U.S. Geological Survey released a report on nationwide trends at water-quality stations. One of the stations that showed an increase in dissolved solids was on the Powder River near Locate. In 1986, the Powder River Conservation District reported that the sodium-adsorption ratio (SAR) had been increasing at Moorhead for the period 1972-84. Based on those trends, the Montana Department of Natural Resources and Conservation asked the U.S. Geological Survey to conduct a cursory review of existing data to determine if those trends could be documented.

The U.S. Geological Survey initiated a small project in 1986 to evaluate existing information at two stations on the Powder River--one at Locate, Montana and the other at Sussex, Wyoming. The period of record at the Locate station extended from 1952 through the present (1987). Two periods were reviewed--one 1952-63 when monthly composites of samples were available and one 1975-85 when samples were collected monthly or bimonthly. The station at Sussex had monthly data for 1967 and 1968 and periodic samples for 1976-85. Trend analyses of raw data from those stations were performed for the parameters of discharge, specific conductance, hardness, calcium, magnesium, sodium, SAR, potassium, alkalinity, sulfate, chloride, and dissolved solids. Positive trends were indicated for the earlier period (1952-63) at Locate for specific conductance, sodium, SAR, sulfate, and dissolved solids. The period 1975-85 indicated trends in specific conductance, sodium, SAR, alkalinity, sulfate, chloride, and dissolved solids.

Data from the station at Sussex displayed trends in sodium, SAR, sulfate, and chloride. There was also a trend in discharge which indicated a decline of about 13 cubic feet per second per year. Because chemistry is closely related to flow, the flow component was removed from the data to detect trends which might be related to changes in the basin. The flow component was removed by developing regressions between flow and each of the parameters. The residuals of the actual value of the parameter subtracted from the predicted value based on the flow models were then tested for trends. These data indicated trends at Locate during the earlier period in only sodium and SAR. The later period showed trends in specific conductance, sodium, SAR, and chloride. Data at Sussex showed trends in sodium, SAR, sulfate, and chloride. After removing the short period of record (1967-68) at Sussex, the only trend remaining was for sodium-adsorption ratio.

The results of the above study have been incorporated into a report that has received technical review within the U.S. Geological Survey. The report is being retyped and should be ready for outside review in 2-3 weeks. It will be circulated to the Montana Department of Natural Resources and Conservation (DNRC) and the Wyoming State Engineer's office before transmittal to the Director of the U.S. Geological Survey for approval and publication.

Based on the preliminary results of study of existing data, the Montana Department of Natural Resources and Conservation developed a proposal for further Powder River water-quality studies to be funded from a Resource Indemnity Trust (RIT) grant. A grant in the amount of $89,000 was approved to provide the State share of a $178,000 cooperative 2-year study to obtain additional water-quality data in the basin. Three water-quality monitoring stations would be installed in the basin and daily conductance samples would be collected at Locate, Moorhead, and Sussex. Synoptic sampling would be initiated to define the areal and temporal variability of water quality in the basin. All remaining water-quality data currently available would be compiled and a salinity model developed that would relate water-quality changes to land use, water-management practices, geology, and other factors that might affect the water quality in the river. The salt-loading transport model would allow algebraic computations that potentially would be able to relate causative factors to water quality. The U.S. Geological Survey would like to ensure that an objective, neutral evaluation of the water-quality conditions in the basin is made. The U.S. Geological Survey Wyoming District office would assist in the study. Mr. Moreland commented that he would also like other State and Federal agencies on both sides of the border to be involved in the study as either active participants or as funding supporters.

The proposal is currently being examined to determine where new stations should be located, what parameters should be tested, what team of people would do the synoptic sampling, and so forth. The money for the project will probably not be available until October 1988. However the study would begin earlier in the summer to gain the benefit of an additional year of runoff data.

The possibility of extending the study to 3 years with funding of $250,000 by involving other agencies was discussed. The Wyoming State Engineer and the Montana Water Resources Division Administrator will act as coordinators in assessing the interest of other agencies in their respective states.

5. STATUS OF WILD AND SCENIC RIVER DESIGNATION:

Ms. Lee reported, at the YRCC's invitation, on the status of studies to determine whether the Little Bighorn River should be designated as a Wild and Scenic River. The Powder River Basin Resource Council has been following the activities of the project. The U.S. Forest Service has retained engineering consultants from

Washington, D.C., to prepare a report using existing Forest Service data. A preliminary draft of the study will be presented to the Forest Service in January for in-house review before release to the public for review and comment, which is scheduled for March 1988. After public comments are received, the U.S. Forest Service will recommend to Congress whether the 19-mile reach should receive Wild and Scenic River designation.

Little Horn Energy Inc. has proposed building a pumped, hydro-electric storage facility. A report prepared by them in 1986 was circulated at the meeting by Ms. Lee. Also circulated was an analysis by the Powder River Resource Council of the Beck Report--a report on the economical feasibility of the project, funded by the State of Wyoming Economic Development and Stabilization Board.

The Powder River Resource Council is endorsing the Wild and Scenic River designation. The Council was organized in 1973 and, according to Ms. Lee, is comprised mainly of farmers and ranchers. The group addresses conservation issues and has been informing the public regarding the Little Bighorn project.

The Little Bighorn pump-back storage power project is a $800 million project that will require two reservoirs. One of the rock dams would be 800 feet in length. The project will enable production of about 1,000 megawatts of electricity.

Mr. Saunders from Little Horn Energy, Inc. reported that Little Horn Energy Inc. received a Federal Energy Regulatory Commission (FERC) permit about a year ago. They have 3 years from that date to acquire a FERC license. The company does not expect to meet the deadline to receive a license, but expects to be granted an extension because of the Federal government's deliberations on the issue of Wild and Scenic River designation. Six bore holes were drilled this summer to obtain geology information. Duke Engineering, a subsidiary of Duke Power, conducted an economic analysis for Little Horn Energy, Inc. The cost estimate made in 1986 was $650 million, which did not include power transmission. Adding a 5-year permitting process and a 5-year construction process with inflation, the cost will probably be in the neighborhood of $1 billion. The Crow Indian Tribe has been contacted regarding the project, but have not met with Little Horn Energy, Inc.

6. OTHER ITEMS:

Mr. Shields inquired if the costs of publishing the YRCC annual report are included in the budget. The budget covers the cost of operation of the gaging stations and publication of that data in the U.S. Geological Survey's annual data reports. Mr. Moore receives money from the Director of the U.S. Geological Survey for preparation and publication of the YRCC annual report and for his travel costs.

The meeting adjourned at 3:00 p.m., at which time an executive session between the Chairman and the Commissioners was held.

Respectfully submitted,

Gordon W. Fassett
Commissioner for Wyoming

Gary Fritz
Commissioner for Montana

L. Grady Moore
Federal Representative

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GENERAL REPORT

Cost of operation and budget

The work funded by the Commission, which to date has been primarily concerned with the collection of required hydrologic data, has been financed through cooperative arrangements whereby Montana and Wyoming each bear one-fourth of the cost and the remaining one-half is borne by the United States. The salaries and necessary expenses of the State and Federal representatives, and hydrologic data made available by other agencies, are not evaluated or considered as expenses of the Commission.

The expense of the Commission during fiscal year 1987 was $33,200, in accordance with the budget adopted for the year.

The budgets for fiscal years 1988 and 1989 were tentatively adopted subject to the availability of appropriations.

The budgets for the three fiscal years are summarized as follows:

October 1, 1986, to September 30, 1987 (fiscal year 1987):

Continuation of existing stream-gaging programs $33,200

October 1, 1987, to September 30, 1988 (fiscal year 1988):

Continuation of existing stream-gaging programs $33,200

October 1, 1988, to September 30, 1989 (fiscal year 1989):

Estimate of continuation of existing stream-gaging programs $36,100

Stream-gaging-station operation

Gaging stations at the measuring sites specified in the Compact were continued in operation and satisfactory discharge records collected at each. After approval by the Commission, the streamflow station on the Clarks Fork Yellowstone River near Silesia, Montana, was relocated December 4, 1986, about 5.8 miles upstream to the previous gaging site at Edgar, Montana. Diversions to the Whitehorse Canal between the two sites will be estimated to allow adjustment of the record. Locations of gaging and reservoir stations are shown on a map of the Yellowstone River Basin at the end of the report.

During the water year ending September 30, 1987, annual streamflow was average in two tributaries and less than average in two other tributaries of the Yellowstone River as given in the following table:

Measurement point	Percent of average
Clarks Fork Yellowstone River at Edgar, Mont.	76
Bighorn River above Tullock Creek, near Bighorn, minus Little Bighorn River near Hardin, Mont. Adjusted for change in contents in Bighorn Lake	82
Tongue River at Miles City, Mont.	57
Powder River near Locate, Mont.	92

Details of streamflow for the 1987 water year and bar graphs showing comparisons with average flows during selected base periods and with the preceding year are given in the section "Monthly summary of discharge for Compact stream-gaging stations."

Diversions

No incidents during the year required administration of the water in accordance with the provisions of the Compact. At the present level of water-resources development, the Commission believes that a program of intensive water-use regulations is not necessary.

Storage in reservoirs

Reservoirs completed after January 1, 1950

Bighorn Lake, a U.S. Bureau of Reclamation project on the Bighorn River, and the largest storage project in the basin, contained 1,025,000 acre-feet at the beginning of the year and 933,600 acre-feet at the close. It fluctuated from a minimum of 781,300 acre-feet on April 19, 1987, to a maximum of 1,025,000 acre-feet on October 3 and 5, 1986. Boysen Reservoir, located on the Wind River and operated by the U.S. Bureau of Reclamation, began the year with 671,900 acre-feet in storage and ended with 682,200 acre-feet. Details regarding these reservoirs are given in the section "Monthly summary of contents for Compact reservoirs completed after January 1, 1950." The Commission is cognizant of other reservoirs in this general group and considers their aggregate effect to be insufficient to warrant the collection of storage data at this time.

Reservoirs existing on January 1, 1950

As a matter of record and general information, month-end storage data are given later in the report for reservoirs in existence upstream from the points of measurement on January 1, 1950. These data are pertinent to allocation under Article V, Section C, Item 3 of the Compact.

MONTHLY SUMMARY OF DISCHARGE FOR COMPACT STREAM-GAGING STATIONS

06208500 Clarks Fork Yellowstone River at Edgar, Mont.

LOCATION.--Lat 45°27'58", long 108°50'35", in SE1/4 SE1/4 SE1/4 sec. 23, T. 4 S., R. 23 E., Carbon County, Hydrologic Unit 10070006, on right bank 400 ft downstream from county bridge, 0.5 mi east of Edgar, 6 mi upstream from Rock Creek, and at mile 27.0.

DRAINAGE AREA.--2,032 mi^2.

PERIOD OF RECORD.--July 1921 to September 1969, October 1986 to September 1987. Records for October 1969 to September 1986 (published as Clarks Fork Yellowstone River near Silesia) at site 5.8 mi downstream not equivalent owing to diversion in Whitehorse Canal during irrigation season. Records since January 1950 available in annual reports of Yellowstone River Compact Commission.

GAGE.--Water-stage recorder. Elevation of gage is 3,460 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Aug. 31, 1953, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Oct. 1 to Dec. 3, Dec. 9 to Feb. 6, Feb. 23 to Mar. 2, Mar. 28-30. Records good except those for Dec. 9 to Feb. 6, Feb. 23 to Mar. 2, Mar. 28-30, which are poor. Diversions for irrigation of about 41,500 acres, of which about 840 acres lies downstream from the station. In addition, about 6,300 acres of land upstream from the station are irrigated by diversions from the adjoining Rock Creek basin. Figures of discharge given herein have the flow of Whitehorse Canal subtracted.

AVERAGE DISCHARGE.--49 years (water years 1922-69, 1987), 1,039 ft^3/s, 752,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 10,900 ft^3/s June 2, 1936, gage height, 8.62 ft; minimum, 36 ft^3/s, Apr. 22, 1961.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,230 ft^3/s, May 28, gage height, 6.59 ft; minimum, 126 ft^3/s, Aug. 22.

Month	Second-foot days	Mean	Maximum	Minimum	Runoff, in acre-feet
October 1986	22,326	720	870	553	44,290
November	17,431	531	800	250	34,570
December	15,811	510	600	300	31,360
January 1987	11,480	370	450	250	22,770
February	9,312	333	420	200	18,470
March	9,992	322	404	190	19,820
April	20,390	680	2,080	300	40,440
May	72,639	2,343	3,940	1,240	144,100
June	53,053	1,768	3,480	554	105,200
July	29,612	955	2,680	297	58,740
August	13,711	442	1,030	143	27,200
September 1987	12,201	407	565	317	24,200
1987 water year	287,962	789	3,940	143	571,200

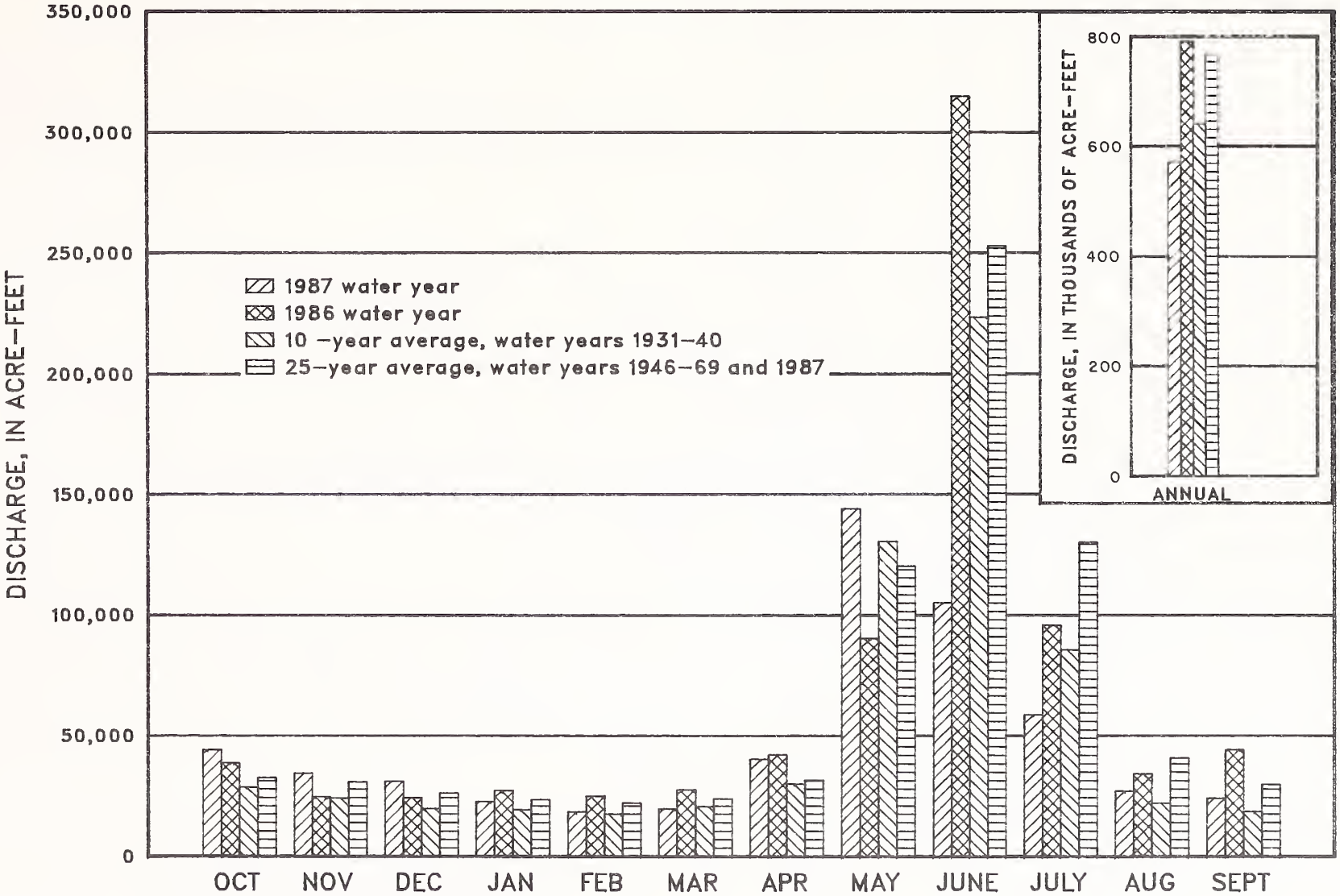


Figure 1.--Comparison of discharge for 1987 water year of Clarks Fork Yellowstone River at Edgar with discharge for 1986 water year of Clarks Fork Yellowstone River near Silesia and with average discharge for water years 1931-40 and 1946-69, 1987.

06294000 Little Bighorn River near Hardin, Mont.

LOCATION.--Lat 45°44'09", long 107°33'24", in SE1/4 NE1/4 NE1/4 sec. 19, T. 1 S., R. 34 E., Big Horn County, Hydrologic Unit 10080016, on left bank 50 ft downstream from bridge on Sarpy Road, 0.2 mi upstream from terminal wasteway of Agency Canal, 0.6 mi upstream from mouth, and 2.3 mi east of Hardin.

DRAINAGE AREA.--1,294 mi^2.

PERIOD OF RECORD.--June 1953 to current year. Records since June 1953 available in annual reports of Yellowstone River Compact Commission.

REVISED RECORDS.--WDR MT-86-1: 1978.

GAGE.--Water-stage recorder. Datum of gage is 2,882.29 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Oct. 7, 1953, nonrecording gage at site 0.4 mi downstream. Oct. 7, 1953, to May 6, 1963, water-stage recorder at site 0.3 mi downstream. May 6, 1963, to Nov. 6, 1963, nonrecording gage at site 0.4 mi downstream. All at different datums. Nov. 7, 1963, to Aug. 15, 1976, water-stage recorder at site 35 ft downstream at present datum. Aug. 15, 1976, to Sept. 30, 1979, water-stage recorders located on each bank downstream of Sarpy Road bridge and were used depending on control conditions.

REMARKS.--Estimated daily discharges: Nov. 5 to Mar. 5. Records good except those for estimated daily discharges, which are poor. Flow partly regulated by Willow Creek Reservoir (capacity 23,000 acre-ft). Diversions for irrigation of 20,980 acres upstream from station. Figures of discharge given herein include flow of terminal wasteway of Agency Canal.

AVERAGE DISCHARGE.--34 years, 306 ft^3/s, 221,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,600 ft^3/s, May 19, 1978, gage height, 11.20 ft, used gage height as obtained at bridge on Sarpy Road; maximum gage height, 11.78 ft, Mar. 20, 1960, site and datum then in use (backwater from ice); minimum discharge observed, 0.20 ft^3/s, Aug. 7, 1961, result of discharge measurement.

EXTREMES FOR CURRENT YEAR--Peak discharges greater than base discharge of 1,000 ft^3/s and maximums(*):

Date	Time	Discharge ft^3/s	Gage height
May 29	1600	*747	*3.56

Minimum daily discharge, 40 ft^3/s, Nov. 10.

Month	Second-foot days	Mean	Maximum	Minimum	Runoff, in acre-feet
October 1986	4,885	158	200	52	9,690
November	4,344	145	200	40	8,620
December	3,854	124	145	90	7,650
January 1987	5,450	176	470	85	10,810
February	6,736	241	480	72	13,360
March	4,947	160	200	80	9,810
April	7,342	245	474	168	14,560
May	11,438	369	723	189	22,690
June	7,592	253	491	117	15,060
July	4,682	151	332	63	9,290
August	3,452	111	216	65	6,850
September 1987	3,788	126	168	102	7,510
1987 water year	68,517	188	723	40	135,900

06294500 Bighorn River above Tullock Creek, near Bighorn, Mont.

LOCATION.--Lat 46°07'29", long 107°28'06", in SE1/4 SE1/4 NE1/4 sec. 3, T. 4 N., R. 34 E., Treasure County, Hydrologic Unit 10080015, on right bank, 1.9 mi upstream from Tullock Creek, 3.0 mi upstream from mouth, 3.6 mi southwest of Bighorn, and 4.5 mi southeast of Custer.

DRAINAGE AREA.--22,414 mi^2. Area at site used Oct. 7, 1955, to Sept. 30, 1981, 22,885 mi^2.

PERIOD OF RECORD.--Oct. 1, 1981, to current year. Records since January 1950 available in annual reports of the Yellowstone River Compact Commission. Previously, published as "06294700 Bighorn River at Bighorn, MT," 1956-81, and as "near Custer," 1945-55. Flows are equivalent at all sites.

GAGE.--Water-stage recorder. Elevation of gage is 2,700 ft above National Geodetic Vertical Datum of 1929, from topographic map. May 11 to Dec. 6, 1945, nonrecording gage, and Dec. 7, 1945, to Oct. 6, 1955, water-stage recorder at different datum. Oct. 7, 1955, to Sept. 30, 1981, at site 2.3 mi downstream at different datum.

REMARKS.--No estimated daily discharges this year. Records good. Flow regulated by Bighorn Lake beginning November 1965 (usable capacity, 1,356,000 acre-ft). Major regulation prior to November 1965 by 14 reservoirs in Wyoming and 1 in Montana with combined usable capacity of about 1,400,000 acre-ft; see sections "Monthly summary of contents for Compact reservoirs." Diversions for irrigation of about 445,200 acres upstream from station.

AVERAGE DISCHARGE.--42 years (water years 1946-81, 1982-87), 3,914 ft^3/s 2,836,000 acre-ft/yr, unadjusted.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 59,200 ft^3/s, May 20, 1978, gage height, 14.15 ft; maximum gage height recorded, 14.21 ft, Apr. 2, 1965 (ice jam); minimum discharge, about 275 ft^3/s, Nov. 15, 1959, result of freezeup; minimum daily, 400 ft^3/s, Apr. 4, 1967.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,700 ft^3/s, July 4, 1983, gage height, 5.66 ft; maximum gage height, 8.52 ft, Jan. 14, 1982 (ice jam); minimum daily discharge, 1,220 ft^3/s, Oct. 18, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,800 ft^3/s, Apr. 3, gage height, 3.26 ft; minimum daily, 1,620 ft^3/s, Oct. 17.

Month	Second-foot days	Mean	Maximum	Minimum	Runoff, in acre-feet	Adjusted runoff, in acre-feet*
October 1986	128,729	4,153	4,420	1,620	255,300	212,800
November	125,520	4,184	4,490	4,040	249,000	192,700
December	119,479	3,854	4,070	3,600	237,000	155,900
January 1987	98,669	3,183	3,600	2,960	195,700	133,100
February	84,519	3,019	3,060	2,970	167,600	147,000
March	102,870	3,318	4,460	3,010	204,000	189,400
April	114,409	3,814	4,770	3,180	226,900	198,300
May	91,889	2,964	3,630	2,320	182,300	224,700
June	90,819	3,027	3,160	2,840	180,100	234,300
July	88,959	2,870	3,580	2,490	176,500	141,500
August	82,739	2,669	3,240	2,420	164,100	151,100
September 1987	70,970	2,366	2,760	2,000	140,800	171,200
1987 water year	1,199,580	3,287	4,770	1,620	2,379,000	2,151,700

*Adjusted for change in contents in Bighorn Lake minus Little Bighorn River near Hardin.

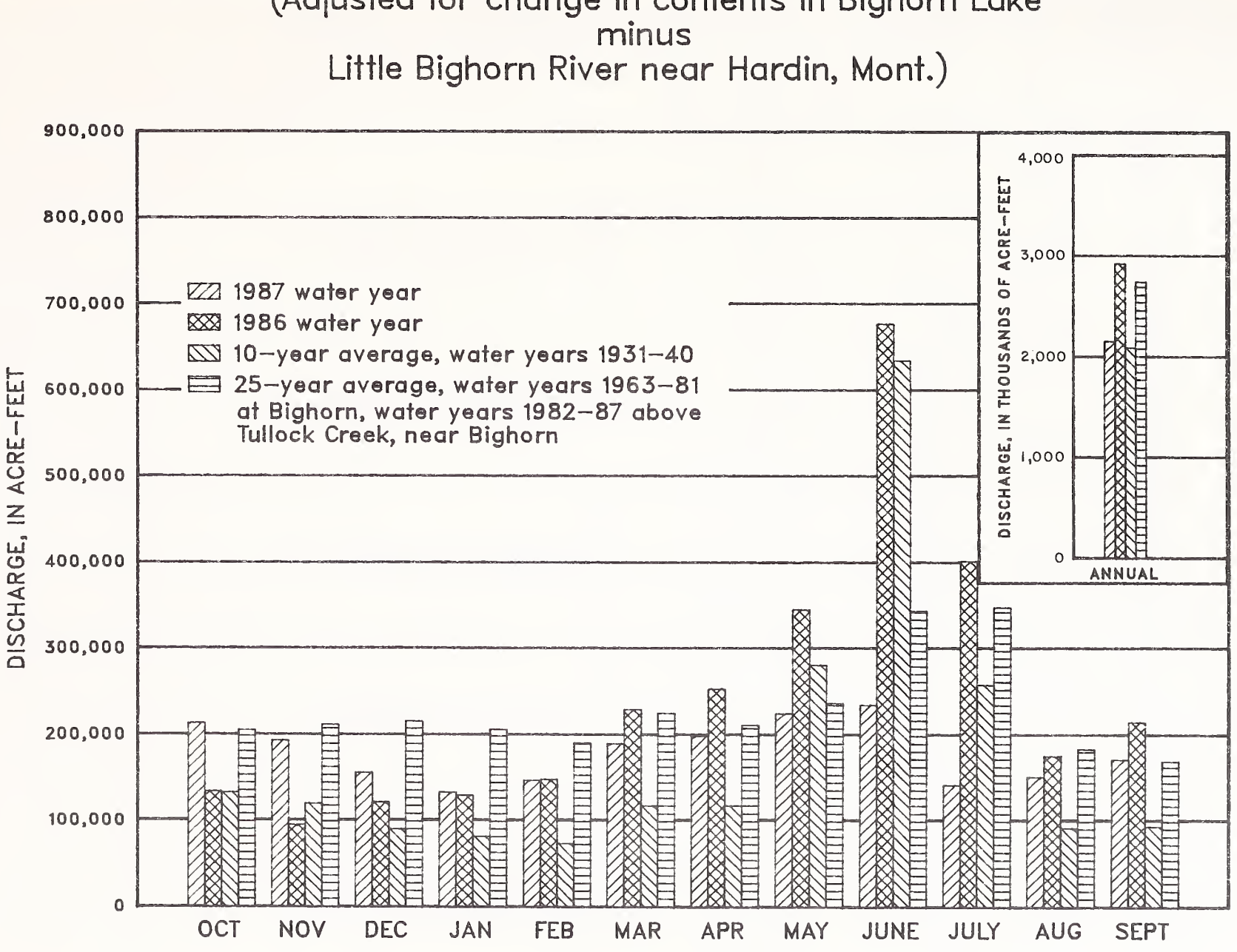


Figure 2.--Comparison of discharge for 1987 water year with discharge for 1986 water year of Bighorn River above Tullock Creek, near Bighorn and with average discharge for water years 1931-40 and 1963-81 at Bighorn and 1982-87 above Tullock Creek, near Bighorn.

06308500 Tongue River at Miles City, Mont.

LOCATION.--Lat 46°20'44", long 105°48'10", in NE1/4 NE1/4 SE1/4 sec. 23, T. 7 N., R. 47 E., Custer County, Hydrologic Unit 10090102, on right bank 4 mi south of Miles City and at mile 8.1.

DRAINAGE AREA.--5,379 mi^2.

PERIOD OF RECORD.--April 1938 to April 1942, April 1946 to current year. Published as "near Miles City" April 1938 to April 1942. Not equivalent to records published as "near Miles City" May 1929 to October 1932. Monthly discharges only for some periods, published in WSP 1309. Records since January 1950 available in annual reports of Yellowstone River Compact Commission.

GAGE.--Water-stage recorder. Datum of gage is 2,375.76 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). April 1938 to April 1942, nonrecording gage at site 8 mi upstream at different datum. April 1946 to Sept. 30, 1963, at datum 1.00 ft higher.

REMARKS.--Estimated daily discharges: Nov. 8 to Mar. 5, Mar. 21, 22, Mar. 27 to Apr. 1. Records good except those for estimated daily discharges, which are poor. Flow regulation by Tongue River Reservoir (see section "Monthly summary of contents for Compact reservoirs existing on January 1, 1950") and many small reservoirs in Wyoming (combined capacity, about 15,000 acre-ft). Diversions for irrigation of about 100,800 acres upstream from station.

AVERAGE DISCHARGE.--44 years (1938-41, 1946-87), 432 ft^3/s, 313,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,300 ft^3/s, June 15, 1962, gage height, 12.33 ft, present datum, from rating curve extended above 8,220 ft^3/s on basis of float measurement; maximum gage height, 13.27 ft, Mar. 19, 1960, Feb. 15, 1971 (ice jam), present datum; no flow July 9-19, Aug. 13, 14, Sept. 28, 1940.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,180 ft^3/s, Aug. 14, gage height, 5.04 ft; minimum daily, 40 ft^3/s, Feb. 26.

Month	Second-foot days	Mean	Maximum	Minimum	Runoff, in acre-feet
October 1986	7,551	244	338	120	14,980
November	10,637	355	500	150	21,100
December	7,700	248	360	170	15,270
January 1987	7,059	228	290	170	14,000
February	5,576	199	330	40	11,060
March	4,323	139	220	100	8,580
April	3,502	117	210	82	6,950
May	7,752	250	750	53	15,380
June	13,114	437	592	261	26,010
July	6,504	210	296	143	12,900
August	7,942	256	1,270	124	15,750
September 1987	7,679	256	318	219	15,230
1987 water year	160,121	245	1,270	40	177,200

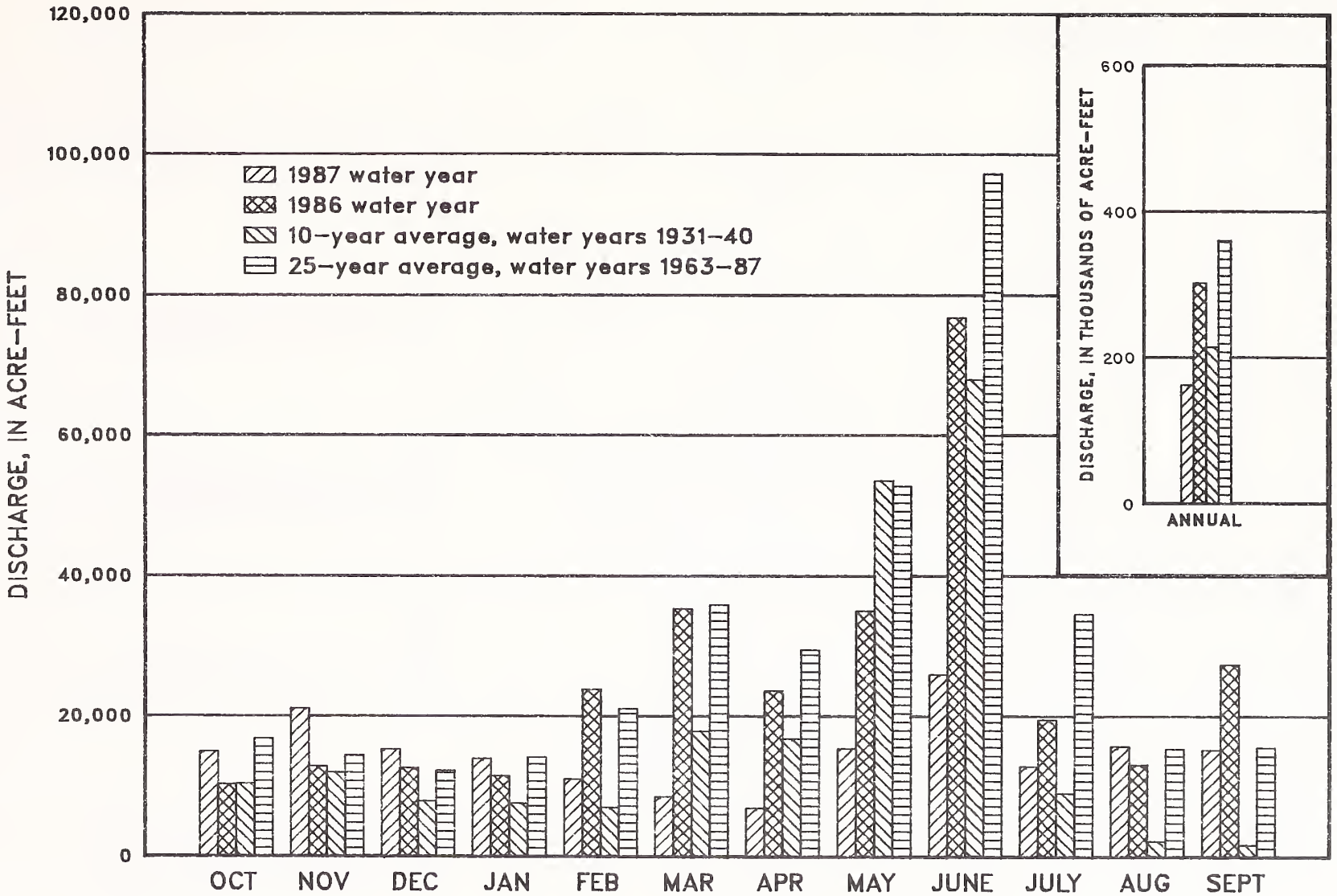


Figure 3.--Comparison of discharge for 1987 water year with discharge for 1986 water year of Tongue River at Miles City and with average discharge for water years 1931-40 and 1963-87.

06326500 Powder River near Locate, Mont.

LOCATION.--Lat 46°26'56", long 105°18'44", in NW1/4 SW1/4 sec. 14, T. 8 N., R. 51 E., Custer County, Hydrologic Unit 10090209, on left bank 1.5 mi downstream from bridge on old U.S. Highway 12 at present site of Locate, 1.5 mi upstream from Locate Creek, 5 mi west of former site of Locate, 25 mi east of Miles City, and at mile 27.9.

DRAINAGE AREA.--13,194 mi^2. Drainage area at site 1.5 mi upstream, 13,189 mi^2.

PERIOD OF RECORD.--March 1938 to current year. Records since January 1950 available in annual reports of Yellowstone River Compact Commission.

REVISED RECORDS.--WSP 926: 1939. WSP 1309: 1938-39 (M). WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,384.79 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to July 11, 1947, nonrecording gage at bridge 1.5 mi upstream, and July 11, 1947, to Sept. 30, 1965, water-stage recorder at site near upstream bridge at different datum. Oct. 1, 1965, to Oct. 4, 1966, nonrecording gage, and Oct. 5, 1966, to Mar. 21, 1978, water-stage recorder at present site and datum. Mar. 22, 1978, to Apr. 23, 1981, water-stage recorder 1.5 mi upstream at different datum, Apr. 24 to Aug. 20, 1981, water-stage recorder at present site and datum, and Aug. 21, 1981, to Sept. 30, 1981, water-stage recorder 1.5 mi upstream at different datum.

REMARKS.--Estimated daily discharges: Nov. 8 to Mar. 8. Records fair except those for estimated daily discharges, which are poor. Some regulation by three reservoirs in Wyoming with combined usable capacity of 36,800 acre-ft. Diversions for irrigation of about 101,800 acres upstream from station.

AVERAGE DISCHARGE.--49 years, 603 ft^3/s, 436,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 31,000 ft^3/s, Feb. 19, 1943, maximum gage height, 12.27 ft, Mar. 16, 1978 (backwater from ice); no flow Jan. 16 to Feb. 12, Feb. 22-24, 1950, July 27, Sept. 21-27, Oct. 1, 1960, Sept. 4-8, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,000 ft^3/s and maximums(*):

Date	Time	Discharge ft^3/s	Gage height (ft)
unknown	unknown	unknown	(a)*10.07
July 20	1745	*3,780	5.68

(a) backwater from ice, from highwater mark.

Minimum daily discharge, 70 ft^3/s, Nov. 11.

Month	Second-foot days	Mean	Maximum	Minimum	Runoff, in acre-feet
October 1986	20,655	666	2,050	401	40,970
November	12,814	427	704	70	25,420
December	6,039	195	350	120	11,980
January 1987	4,470	144	220	80	8,870
February	15,700	561	900	250	31,140
March	36,336	1,172	3,000	300	72,070
April	23,851	795	1,200	500	47,310
May	20,292	655	1,150	254	40,250
June	25,817	861	2,380	329	51,210
July	14,275	460	2,690	106	28,310
August	10,559	341	1,150	188	20,940
September 1987	12,851	428	500	353	25,490
1987 water year	203,664	558	3,000	70	404,000

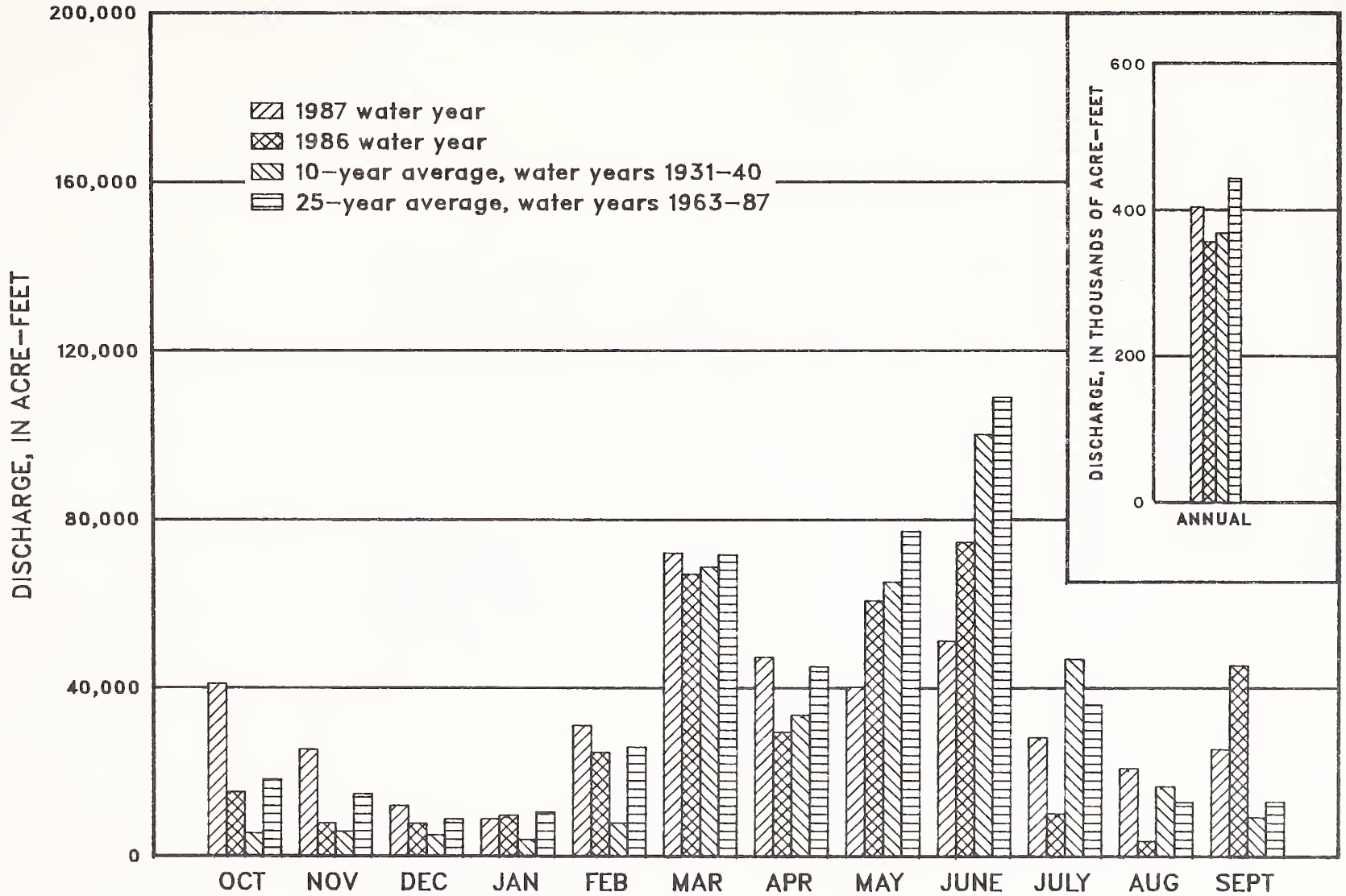


Figure 4.--Comparison of discharge for 1987 water year with discharge for 1986 water year of Powder River near Locate and with average discharge for water years 1931-40 and 1963-87.

MONTHLY SUMMARY OF CONTENTS FOR COMPACT RESERVOIRS COMPLETED AFTER JANUARY 1, 1950

06258900 Boysen Reservoir, Wyo.

LOCATION.--Lat 43°25'00", long 108°10'37", in NW1/4 NW1/4 sec. 16, T. 5 N., R. 6 E., Fremont County, Hydrologic Unit 10080005, at dam on Wind River and 13 mi north of Shoshoni, Wyoming.

DRAINAGE AREA.--7,700 mi^2.

PERIOD OF RECORD.--October 1951 to current year (monthend contents only).

GAGE.--Water-stage recorder. Datum of gage is referenced to National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation).

REMARKS.--Reservoir is formed by rock-fill dam completed in October 1951. Storage began Oct. 11, 1951. Usable capacity, 742,100 acre-ft between elevation 4,657.00 ft, invert of penstock pipe, and 4,725.00 ft, top of spillway gate. Dead storage, 59,880 acre-ft below elevation 4,657.00 ft. Prior to Jan. 1, 1966, usable capacity was 757,800 acre-ft and dead storage was 62,000 acre-ft at same elevations. Crest of dam is at elevation 4,758 ft. Figures given herein represent usable contents. Water used for irrigation, flood control, and power development.

COOPERATION.--Records furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum usable daily contents, 862,500 acre-ft, July 6, 7, 1967, elevation, 4,730.83 ft; minimum usable daily since normal use of water started, 191,900 acre-ft, Mar. 18, 19, 1956, elevation, 4,684.18 ft, capacity table then in use.

EXTREMES FOR CURRENT YEAR.--Maximum usable contents, 706,900 acre-ft Aug. 2, 4, elevation, 4,723.17 ft; minimum usable, 499,300 acre-ft, Apr. 18, elevation, 4,710.96 ft.

Month	Water-surface elevation, in feet	Usable contents, in acre-feet	Change in contents, in acre-feet
September 30, 1986.	4,721.29	671,900	
October 31.	4,720.78	662,600	-9,300
November 30	4,719.18	633,900	-28,700
December 31	4,716.98	593,700	-38,200
January 31, 1987.	4,715.04	563,300	-32,400
February 28	4,713.14	532,900	-30,400
March 31.	4,712.23	518,700	-14,200
April 30.	4,712.03	515,600	-3,100
May 31.	4,717.64	607,000	+91,400
June 30	4,721.95	684,000	+77,000
July 31	4,723.12	705,900	+21,900
August 31	4,722.60	696,200	-9,700
September 30, 1987.	4,721.85	682,200	-14,000
1987 water year			+10,300

06260300 Anchor Reservoir, Wyo.

LOCATION.--Lat 43°39'50", long 108°49'27", in sec. 26, T. 43 N., R. 100 W., Hot Springs County, Hydrologic Unit 10080007, at dam on South Fork Owl Creek, 2 mi downstream from Middle Fork, 3 mi southeast of Anchor, and 32 mi west of Thermopolis.

DRAINAGE AREA.--131 mi^2.

PERIOD OF RECORD.--November 1960 to current year (monthend contents only).

GAGE.--Water-stage recorder. Datum of gage is referenced to National Geodetic Vertical Datum of 1929 (U.S. Bureau of Reclamation benchmark).

REMARKS.--Reservoir is formed by concrete arch dam completed in 1960. Usable capacity, 17,170 acre-ft between elevation 6,343.75 ft, invert of river outlet, and 6,441.00 ft, spillway crest, not including 68 acre-ft below elevation 6,343.75 ft. Prior to Oct. 1, 1971, usable capacity was 17,280 acre-ft not including 149 acre-ft below the invert. Figures given herein represent usable contents. Water is used for irrigation of land in Owl Creek basin.

COOPERATION.--Records furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum usable daily contents, 9,250 acre-ft, July 4, 1967, elevation, 6,418.52 ft; no storage on many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum usable contents, 1,650 acre-ft, Aug. 1, elevation, 6,366.75 ft; no usable storage most of year.

Month	Water-surface elevation, in feet	Usable contents, in acre-feet	Change in contents, in acre-feet
September 30, 1986.	6,304.30	0	0
October 31.	6,304.30	0	0
November 30	6,304.00	0	0
December 31	6,304.30	0	0
January 31, 1987.	6,304.30	0	0
February 28	6,304.30	0	0
March 31.	6,304.30	0	0
April 30.	6,355.00	186	+186
May 31.	6,340.00	0	-186
June 30	6,340.00	0	0
July 31	6,366.50	638	+638
August 31	6,340.00	0	-638
September 30, 1987.	6,340.00	0	0
1987 water year			0

06286400 Bighorn Lake near St. Xavier, Mont.

LOCATION.--Lat 45°18'27", long 107°57'26", in SW1/4 SE1/4 sec. 18, T. 6 S., R. 31 E., Big Horn County, Hydrologic Unit 10080010, in block 13 of Yellowtail Dam on Bighorn River, 1.3 mi upstream from Grapevine Creek, 15.5 mi southeast of St. Xavier, and at mile 86.6.

DRAINAGE AREA.--19,626 mi^2.

PERIOD OF RECORD.--November 1965 to current year (monthend contents only). Prior to October 1969, published as "Yellowtail Reservoir."

GAGE.--Water-stage recorder in powerhouse control room. Datum of gage is referenced to National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation).

REMARKS.--Reservoir is formed by thin concrete-arch dam; construction began in 1961; completed in 1967. Storage began Nov. 3, 1965. Usable capacity, 1,356,000 acre-ft between elevation 3,296.50 ft, river outlet invert, and 3,657.00 ft, top of flood control. Elevation of spillway crest, 3,593.00 ft. Normal maximum operating level, 1,097,000 acre-ft, elevation, 3,640.00 ft. Minimum operating level, 483,400 acre-ft, elevation 3,547.00 ft. Dead storage, 16,010 acre-ft below elevation 3,296.50 ft. Figures given herein represent usable contents. Water is used for power production, flood control, irrigation, and recreation.

COOPERATION.--Elevations and capacity table furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 1,346,000 acre-ft, July 6, 1967, elevation, 3,656.43 ft; minimum since first filling, 660,700 acre-ft, Mar. 11, 1970, elevation, 3,584.45 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,025,000 acre-ft, Oct. 3, 5, elevation, 3,637.66 ft; minimum, 781,300 acre-ft, Apr. 19, elevation, 3,609.05 ft.

Month	Water-surface elevation, in feet	Usable contents, in acre-feet	Change in contents, in acre-feet
September 30, 1986	3,637.60	1,025,000	
October 31	3,634.74	992,200	-32,800
November 30	3,630.10	944,500	-47,700
December 31	3,621.71	871,000	-73,500
January 31, 1987	3,614.79	819,200	-51,800
February 28	3,613.76	812,200	-7,200
March 31	3,613.05	807,200	-4,800
April 30	3,610.94	793,200	-14,000
May 31	3,628.10	858,300	+65,100
June 30	3,628.31	927,600	+69,300
July 31	3,625.44	901,900	-25,700
August 31	3,624.71	895,700	-6,200
September 30, 1987	3,628.96	933,600	+37,900
1987 water year			-91,400

MONTHLY SUMMARY OF CONTENTS FOR COMPACT RESERVOIRS EXISTING ON JANUARY 1, 1950

The extent, if any, of the use of reservoirs in this category which may be subject to Compact allocations was not determined. As a matter of hydrologic interest the monthend contents in acre-feet of four reservoirs are given. The first three reservoirs are in the Bighorn River basin, Wyoming, and data on contents were furnished by the U.S. Bureau of Reclamation. The Tongue River Reservoir in Montana is operated under the supervision of the Water Resources Division of the Montana Department of Natural Resources and Conservation, which furnished the operating data.

Contents, in acre-feet

Month	06224500 [a]/Bull Lake	[b]/Pilot Butte Reservoir	06281500 [c]/Buffalo Bill Reservoir	06307000 [d]/Tongue River Reservoir
September 30, 1986. . .	90,640	20,780	260,400	16,100
October 31.	92,720	21,110	227,200	19,020
November 30	93,800	17,640	272,500	----
December 31	93,640	20,780	271,500	----
January 31, 1987. . . .	93,350	20,700	270,400	----
February 28	92,850	20,620	272,100	----
March 31.	92,240	20,700	274,700	24,260
April 30.	88,730	24,390	286,100	45,650
May 31.	126,300	25,560	343,400	59,790
June 30	145,100	17,980	372,300	54,600
July 31	140,100	19,420	327,600	44,150
August 31	118,300	8,520	263,500	35,200
September 30, 1987. . .	92,770	0	209,700	31,470
Change in contents during water year. .	+2,130	-20,780	-50,700	+15,370

[a]/ Usable contents, from revised capacity table effective October 1, 1965. Dead storage is 722 acre-ft.

[b]/ Usable contents. Dead storage is 5,360 acre-ft.

[c]/ Usable contents, from revised capacity table based on survey of 1959. Contents prior to October 1960 based on survey of 1941. Dead storage is negligible.

[d]/ Usable contents. Dead storage is 1,400 acre-ft. Contents based upon sedimentation surveys of October 1948.

RULES AND REGULATIONS FOR ADMINISTRATION OF THE YELLOWSTONE RIVER COMPACT

A compact, known as the Yellowstone River Compact, between the States of Wyoming, Montana, and North Dakota, having become effective on October 30, 1951, upon approval of the Congress of the United States, which apportions the waters of certain interstate tributaries of the Yellowstone River which are available after the appropriative rights existing in the States of Wyoming and Montana on January 1, 1950 are supplied, and after appropriative rights to the use of necessary supplemental water are also supplied as specified in the Compact, is administered under the following rules and regulations subject to the provisions for amendment revision or abrogation as provided herein.

Article I. Collection of Water Records

A. It shall be the joint and equal responsibility of the members of the States of Wyoming and Montana to collect, cause to be collected, or otherwise furnish records of tributary streamflow at the points of measurement specified in Article V (B) of the Compact, or as near thereto as is physically or economically feasible or justified.

1. Clarks Fork

The gaging station known as Clarks Fork near Silesia, Montana and located in NW1/4 SE1/4 sec. 1, T. 4 S., R. 23 E., shall be the point of measurement for the Clarks Fork.

2. Bighorn River (exclusive of Little Bighorn River)

The gaging station known as the Bighorn River above Tullock Creek, near Bighorn, Montana, and located in SE1/4 SE1/4 NE1/4 sec. 3, T. 4 N., R. 34 E., shall temporarily be the designated point of measurement on that stream. The flow of the Little Bighorn River as measured at the gaging station near Hardin, Montana, and located in SE1/4 NE1/4 NE1/4 sec. 19, T. 1 S., R. 34 E., shall be considered the point of measurement for that stream, except that if or when satisfactory records are not available, the records for the nearest upstream station with practical corrections for intervening inflow or diversion shall be used.

3. Tongue River

The gaging station known as the Tongue River at Miles City, Montana, and located in NE1/4 NE1/4 SE1/4 sec. 23, T. 7 N., R. 47 E., shall temporarily be the point of measurement for that stream.

4. Powder River

The gaging station known as the Powder River near Locate, Montana, and located in NW1/4 SW1/4 sec. 14, T. 8 N., R. 51 E., shall temporarily be the designated point of measurement for that stream.

B. Records of total annual diversion in acre-feet above the points of measurement designated in the Compact for irrigation, municipal, and industrial uses developed after January 1, 1950, shall be furnished by the members of the Commission for their respective States, at such time as the Commission deems necessary for interstate administration as provided by the terms of the Compact. Providing that if it be acceptable to the Commission, reasonable estimates thereof may be substituted.

C. Annual records of the net change in storage in all reservoirs, not excluded under Article V (E) of the Compact, above the point of measurement specified in the Compact and completed after January 1, 1950, and the annual net change in reservoirs existing prior to January 1, 1950, which is used for irrigation, municipal, and industrial purposes developed after January 1, 1950, shall be the primary responsibility of the member of the Commission in whose State such works are located; providing such data are not furnished by Federal agencies under the provisions of Article III (D) of the Compact, or collected by the Commission.

Article II. Office and Officers

A. The office of the Commission shall be located at the office of the Chairman of the Commission.

B. The Chairman of the Commission shall be the Federal representative as provided in the Compact.

C. The Secretary of the Commission shall be as provided for in Article III of these rules.

D. The credentials of each member of the Commission shall be placed on file in the office of the Commission.

Article III. Secretary

A. The Commission, subject to the approval of the Director of the United States Geological Survey, shall enter into cooperative agreements with the U.S. Geological Survey for such engineering and clerical services as may reasonably be necessary for the administration of the Compact. Said agreements shall provide that the Geological Survey shall:

1. Maintain and operate gaging stations at or near the points of measurement specified in Article V (A) of the Compact.

2. Assemble factual information on stream flow, diversion, and reservoir storage for the preparation of an annual report to the Governors of the signatory States.

3. Make such investigations and reports as may be requested by the Commission in aid of its administration of the Compact.

B. The Geological Survey shall act as Secretary to the Commission.

Article IV. Budget

A. At the annual meeting of each even-numbered year or prior thereto, the Commission shall adopt a budget for operation during the ensuing biennium beginning July first. Such budget shall set forth the total cost of construction, maintenance and operation of gaging stations, the cost of engineering and clerical aid, and other necessary expenses excepting the salaries and personal expenses of the Commissioners. On odd-numbered years revisions of the budget shall be considered.

B. It shall be the obligation of the Commissioners of the States of Montana and Wyoming to endeavor to secure from the Legislature of their respective States sufficient funds with which to meet the obligations of this Compact, except insofar as provided by the Federal government.

Article V. Meetings

An annual meeting of the Commission shall be held each November at some mutually agreeable point in the Yellowstone River Basin for consideration of the annual report for the water year ending the preceding September 30th, and for the transaction of such other business consistent with its authority; provided that by unanimous consent of the Commission the date and place of the annual meeting may be changed. Other meetings as may be deemed necessary shall be held at a time and place set by mutual agreement, for the transaction of any business consistent with its authority.

No action of the Commission shall be effective until approval by the Commissioners for the States of Wyoming and Montana.

Article VI. Amendments, Revisions and Abrogations.

The Rules and Regulations of the Commission may be amended or revised by a unanimous vote at any meeting of the Commission.

Gary Fritz
Commissioner for Montana

George L. Christopulos
Commissioner for Wyoming

ATTESTED:

L. Grady Moore
Federal Representative

Adopted November 17, 1953
Amended December 16, 1986

RULES FOR ADJUDICATING WATER RIGHTS ON INTERSTATE DITCHES

Article I. Purpose

The purpose of this rule is to determine and adjudicate, in accordance with the laws of Montana and Wyoming, those pre-Compact (January 1, 1950) water rights for diverting from the Powder, Tongue, Bighorn and Clarks Fork Rivers and their tributaries where the point of diversion is in one State and the place of use is in the other State.

Article II. Authority

In accordance with the Yellowstone River Compact, the State of Montana and the State of Wyoming, being moved by consideration of interstate comity, desire to remove all causes of present and future controversy between the States and between persons in one State and persons in another State with respect to these interstate ditches. Article III (E) of the Compact provides the Yellowstone River Compact Commission with the authority "....to formulate rules and regulations and to perform any act which they may find necessary to carry out the provisions of this Compact...."

Article III. Definitions

The terms defined in the Yellowstone River Compact apply as well as the following definitions:

1. "Acre-feet" means the volume of water that would cover 1 acre of land to a depth of 1 foot.

2. "Cubic foot per second" means a flow of water equivalent to a volume of 1 cubic foot that passes a point in 1 second of time and is equal to 40 miners inches in Montana.

3. "Interstate Ditches" shall include ditches and canals which convey waters of the Bighorn, Tongue, Powder, and Clarks Fork Rivers and their tributaries across the Wyoming-Montana State line where the water is diverted in one State and the place of use is in the other State.

4. "Department of Natural Resources and Conservation," hereafter called the "Department," means the administrative agency and Department of the Executive Branch of the Government of Montana created under Title II, Chapter 15, MCA which has the responsibility for water administration in that State.

5. "Water Court" means a Montana District Court presided over by a water judge, as provided for in Title III, Chapter 7, MCA.

6. "State Engineer" shall be the current holder of the position created by the Wyoming Constitution as Chief Water Administration Official for the State of Wyoming.

7. "Board of Control," hereinafter called the "Board," is defined as the constitutionally created water management agency in Wyoming composed of the four Water Division Superintendents and the State Engineer.

8. "Superintendent" is the member of the Board who is the water administration official for the Water Division where the interstate ditch is located. (The two Water Divisions in the Yellowstone River drainage are Water Division Numbers Two and Three.)

9. "Date of Priority" shall mean the earliest date of actual beneficial use of water, unless evidence and circumstances pertaining to a particular claim establish an earlier date.

10. "Point of Diversion" is defined to be the legal land description by legal subdivision, section, township, and range of the location of the diversion structure for an interstate ditch from a natural stream channel.

11. "Place of Use" is defined to be the legal land description (legal subdivision, section, township, and range) of the lands irrigated by an interstate ditch.

12. "Person" is defined as an individual, a partnership, a corporation, a municipality or any other legal entity, public or private.

13. "Claimant" is defined as any person claiming the use of water from an interstate ditch as herein defined.

Article IV. Procedures

The procedures for determining and adjudicating water rights associated with interstate ditches shall be categorized as follows: (A) Where the point of diversion is in Wyoming and place of use in Montana, and (B) Where the point of diversion is in Montana and place of use in Wyoming.

A. Wyoming Procedure

1. The Yellowstone River Compact Commission will provide a claim form to be completed by the claimant that will describe the location and point of diversion and land being irrigated, the priority date claimed, method of irrigation and such other information required to describe the claim.

2. The Yellowstone River Compact Commission will send the claim form to water users on the interstate ditches.

3. Water users will complete the claim form and file it with the Yellowstone Compact Commission, which, when found to be correct and complete, will be forwarded to the Board for verification.

4. Upon receipt of the form, the Board shall forward it to the appropriate Superintendent, who in cooperation with the Department, will validate the information including the use that has been made of the water, the number of acres and location of lands being irrigated, the priority date, and all other relevant information. The Superintendent and the Department will utilize aerial photography and other information to have prepared a reproducible map showing the location of the ditch system, lands irrigated, point of diversion, etc., of the claim.

5. After the validation procedure, the Superintendent will hold a hearing, after appropriate notice and advertisement, at which time the claimant shall describe, in detail, the use that has been made of the water and the lands that are being irrigated, establish a priority date, etc. Costs incurred in advertising shall be paid by the claimant. If a single hearing is held to consider several claims, the costs of advertising shall be shared equally among the claimants. Anyone who opposes the claim shall appear and state the reasons, if any, for opposition to the claim. If there is no opposition to the claim, cost incurred in holding the hearing shall be paid by the claimant. If protestants do appear and oppose the claim, hearing costs will be paid 50 percent by the claimant and 50 percent by the protestant, or if there is more than one protestant, the remaining 50 percent shall be shared equally among the protestants.

6. At the conclusion of the hearing, the Superintendent shall forward the record to the Yellowstone River Compact Commission with findings and recommendations. The Yellowstone River Compact Commission will make the

determination of the amount of the right, the location, and the priority date, and then send the record to the Board.

7. The Board shall review the record and integrate it into its water rights system. Upon entry of the record by the Board, the information shall be forwarded to the Department and the Chairman of the Yellowstone River Compact Commission.

8. Upon the entry of the right into the Board's records, it would have the following attributes:

   a. The right will be a Wyoming water right with a priority date as established by this procedure.

   b. The amount of the right will be determined as provided by Wyoming law, i.e., 1 cubic foot per second per 70 acres, with an additional 1 cubic foot per second if the right has priority earlier than March 1, 1945, under the Wyoming Surplus Water Law, 41-4-318 and 41-4-319, W.S. 1977.

B. Montana Procedure

1. The Yellowstone River Compact Commission will provide a claim form to be completed by the claimant that will describe the location and point of diversion and land being irrigated, the priority date claimed, method of irrigation and such other information required to describe the claim.

2. The Commission will send the claim form to water users on the interstate ditches.

3. Water users will complete the claim form and file it with the Yellowstone River Compact Commission, which, when found to be correct and complete, will be forwarded to the Department for verification.

4. Upon receipt of the form, the Department, in cooperation with the Wyoming State Engineer's Office, will validate the information, including the use that has been made of the water, the number of acres and location of lands being irrigated, the priority date, and all other relevant information. The appropriate Superintendent and the Department will utilize aerial photographs and other information to have prepared a reproducible map showing the location of the ditch system, land irrigated, point of diversion, etc., of the claim.

5. The Department would then forward the record to the Yellowstone River Compact Commission with its findings and recommendations. Upon approval by the Commission, the record shall be submitted to the Montana Water Court for adjudication. A duplicate record will be forwarded to the Wyoming State Engineer's Office, the Board, and the Chairman of the Yellowstone River Compact Commission upon adjudication.

6. Upon adjudication of the right by the Montana Water Court, it would have the following attributes:

   a) The right will be a Montana water right with a priority date as established by this procedure.

   b) The amount of the right will be determined as provided by Montana law.

Article V. Exclusions

A. These rules recognize the limitation in Article VI of the Yellowstone River Compact regarding Indian water rights.

B. These rules shall not be construed to determine or interpret the rights of the States of Wyoming and Montana to the waters of the Little Bighorn River.

Article VI. Claim Form Submission Period

All claims must be submitted to the Yellowstone River Compact Commission, c/o L. Grady Moore, United States Geological Survey, 821 E. Interstate, Bismarck, ND 58501 no later than December 31, 1984.

Gary Fritz
Gary Fritz
Commissioner for Montana

George L. Christopulos
George L. Christopulos
Commissioner for Wyoming

ATTESTED:

L. Grady Moore
L. Grady Moore
Federal Representative

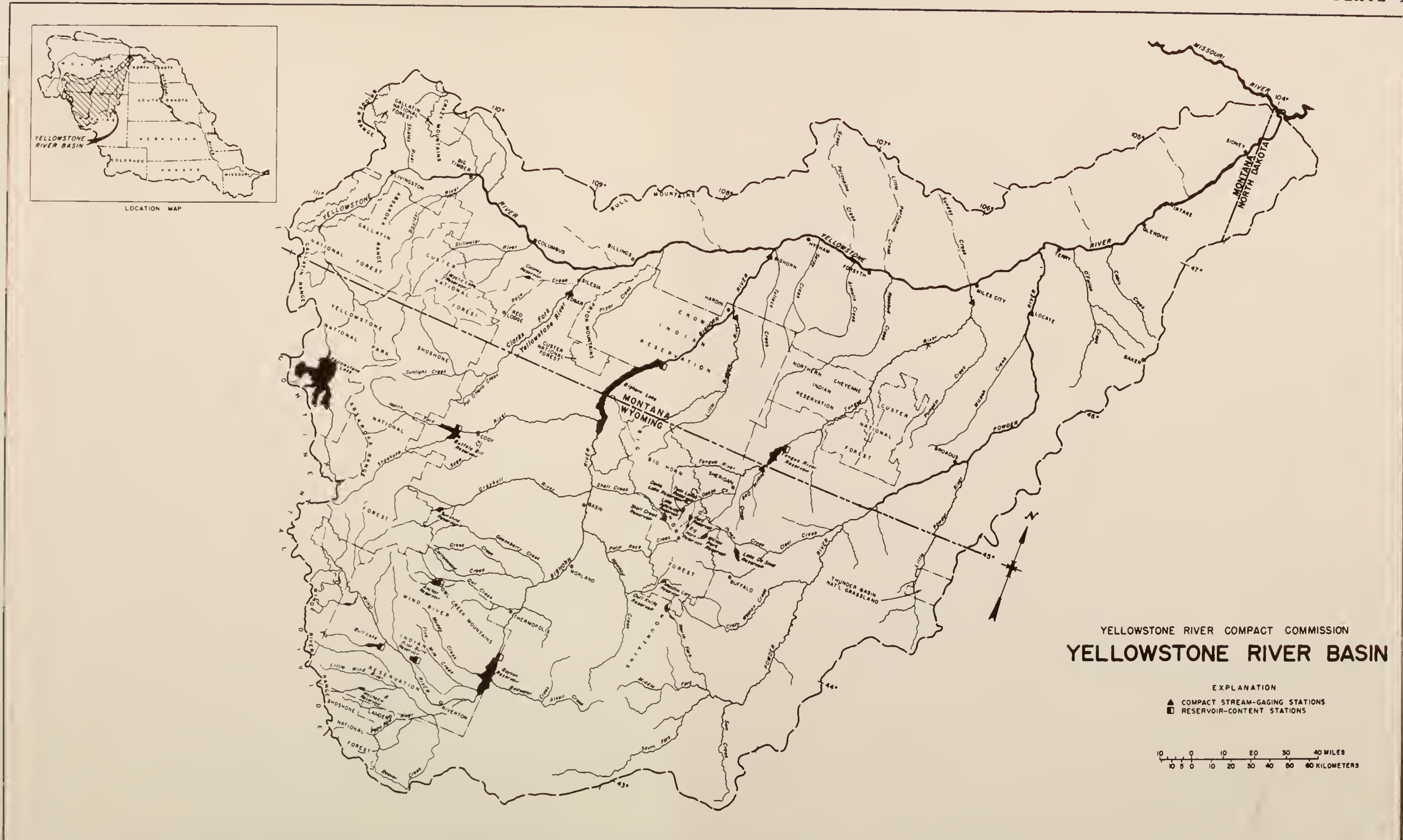
Adopted September 20, 1984

METRIC CONVERSION TABLE

The following factors may be used to convert the inch-pound units published herein to the International System (SI) of metric units. Subsequent reports will contain both the inch-pound and SI unit equivalents in the station manuscript descriptions until such time that all data will be published in SI units.

Multiply inch-pound units	By	To obtain SI units
	Length	
feet (ft)	.3048	meters (m)
miles (mi)	1.609	kilometers (km)
	Area	
acres	4047	square meters (m^2)
	.4047	*hectares (ha)
	.4047	square hectometer (hm^2)
	.004047	square kilometers (km^2)
square miles (mi^2)	2.590	square kilometers (km^2)
	Volume	
cfs-day or second-foot day (ft^3/s-day)	2447	cubic meters (m^3)
	.002447	cubic hectometers (hm^3)
cubic feet	.02832	cubic meters
acre-feet (acre-ft)	1233	cubic meters (m^3)
	.001233	cubic hectometers (hm^3)
	.000001233	cubic kilometers (km^3)
	Flow	
cubic feet per second (ft^3/s)	28.32	liters per second (L/s)
	28.32	cubic decimeters per second (dm^3/s)
	.02832	cubic meters per second (m^3/s)
acre-feet per year (acre-ft/yr)	1233	cubic meters per year (m^3/yr)
	.001233	cubic hectometers per year (hm^3/yr)
	.000001233	cubic kilometers per year (km^3/yr)

*The unit hectare is approved for use with the International System (SI) for a limited time. See NBS Special Bulletin 330, p. 15, 1972 edition.



MAP SHOWING LOCATIONS OF COMPACT STREAM-GAGING AND RESERVOIR-CONTENT STATIONS